

Message Text

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TAGS: TECH, UK

SUBJECT: ELECTRIC CARS

REF: STATE 224733

1. IN RESPONSE TO REQUEST CONTAINED IN REFTEL, UK DEPT OF INDUSTRY HAS PROVIDED INFORMATION GIVEN BELOW ON ELECTRIC CARS. INFO A KEYED TO QUESTIONS CONTAINED PARA 2 REFTEL. IN ADDITION, UKG HAS SUPPLIED TWO-PART REPORT ENTITLED "A REVIEW OF MARKET PROSPECTS FOR BATTERY ELECTRIC VEHICLES" PREPARED BY TRANSPORT AND ROAD RESEARCH LABORATORY. IN VIEW OF TIME FACTOR, WE ARE AIRMAILING REPORT DIRECT TO SENATE COMMERCE COMMITTEE.

2. DEPT OF INDUSTRY INFORMATION FOLLOWS:
"ELECTRIC VEHICLES: US SENATE COMMITTEE ON COMMERCE HEARINGS.

IT IS ASSUMED THAT "VEHICLES" IMPLIES ROAD VEHICLES AND THAT FORK LIFT TRUCKS AND OTHER VEHICLES NOT USED ON THE ROAD ARE EXCLUDED FROM THE QUESTIONS.

1. UK GOVERNMENT EXPENDITURE HAS BEEN PRIMARILY DIRECTED AT THE BATTERY PROBLEM. WORK ON THE SODIUM SULPHUR BATTERY
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IS PROCEEDING. EXPENDITURE IN THE PERIOD 1967/1974 WAS

L500,000 IN THE FIELDS OF ELECTRIC VEHICLES AND BATTERY DEVELOPMENT. THERE HAS NOT BEEN ANY GOVERNMENT SUPPORT FOR HYBRID VEHICLE DEVELOPMENT. TWO UK BATTERY MANUFACTURERS, CHLORIDE LIMITED AND JOSEPH LUCAS LIMITED HAVE FUNDED THE DEVELOPMENT AND DEMONSTRATION OF A RANGE OF VEHICLES. EACH COMPANY HAS A BUS UNDERGOING EVALUATION BY GREATER MANCHESTER TRANSPORT AND LUCAS IS DELIVERING 10 ELECTRIC VANS TO THE POST OFFICE FOR EVALUATION. ADVANCED VEHICLE SYSTEMS LIMITED HAS DEVELOPED A DRIVE SYSTEM FOR ELECTRIC VEHICLES USING A TORQUE CONVERTER AND IS DEMONSTRATING VEHICLES FITTED WITH THIS SYSTEM. THE ELECTRICITY COUNCIL HAS ORDERED 61 CARS FROM ENFIELD AUTOMOTIVE LTD FOR EVALUATION. THE COSTS OF THESE PROJECTS ARE NOT KNOWN. THE ENFIELD CAR HOWEVER IS ON SALE AT L2,808 EX WORKS.

2. ELECTRIC ROAD VEHICLES ARE USED WIDELY IN THE UK. THERE IS NO OFFICIAL VEHICLE POPULATION STATISTIC AVAILABLE, BUT TOTAL POPULATION IN 1975 IS ESTIMATED AT BETWEEN 40,000 AND 50,000 VEHICLES. OF THESE APPROXIMATELY THREE QUARTERS ARE USED FOR MILK DELIVERY WHICH REPRESENTS THE LARGEST APPLICATION. HYBRID VEHICLES ARE NOT IN USE. THE POPULATION OF ELECTRIC ROAD VEHICLES HAS GROWN STEADILY OVER THE LAST 30 YEARS. CURRENT PRODUCTION OF BATTERY ELECTRIC ROAD VEHICLES IS AROUND 2,000 PER YEAR (1973 - 1,824 VEHICLES, 1974 - 2,094 VEHICLES), BUT INFORMATION ON SCRAP RATES IS NOW KNOWN. THE CURRENT GROWTH RATE IS THEREFORE OBSCURED. IN THE SHORT TERM INCREASED GROWTH WILL DEPEND UPON BREAKING INTO NEW MARKETS, AND IN THE LONG-TERM UPON THE AVAILABILITY OF IMPROVED BATTERIES. THERE ARE NO OFFICIAL FORECASTS OF ELECTRIC ROAD VEHICLE POPULATION AND IN VIEW OF THE UNCERTAINTIES OF MARKET AND TECHNOLOGY, A 10-YEAR FORECAST WOULD BE UNRELIABLE.

3. INTERNATIONAL CO-OPERATION WOULD BE BEST SERVED BY ENCOURAGING CONTACT BETWEEN THOSE DIRECTLY CONCERNED WITH THIS BRANCH OF TRANSPORT DEVELOPMENT.

4. THE LIGHTWEIGHT LEAD ACID BATTERY AND THE SODIUM SULPHUR BATTERY ARE BOTH UNDER DEVELOPMENT IN THE UK. THE LIGHTWEIGHT LEAD ACID BATTERY MAY BE AVAILABLE COMMERCIALY BY 1980, AS WILL ALSO BE IMPROVED MOTORS AND CONTROLLERS. THE HYBRID VEHICLE IS UNLIKELY TO HAVE REACHED A HIGH STATE OF DEVELOPMENT.

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5. SUITABLE AREAS FOR DEVELOPMENTS ARE MOTORS, CONTROLLERS AND TRANSMISSIONS.

6. SIGNIFICANT OIL SAVINGS COULD BE ACHIEVED BY IMPROVEMENTS TO THE ENGINES OF EXISTING TYPES OF VEHICLES. SIMILARLY REDUCTIONS IN EMISSIONS AND NOISE COULD BE ACHIEVED WITH EXISTING ENGINES, ALTHOUGH THE ZERO LOCAL EMISSIONS QUALITY OF THE ELECTRIC

VEHICLES COULD NOT BE MATCHED. SUBSTITUTION OF OIL BY OTHER LIQUID OR GASEOUS FUELS NOT DERIVED FROM PETROLEUM WOULD YIELD A SAVING IN PETROLEUM CONSUMPTION.

7. EXISTING PRODUCTION AND EXPERIMENTAL VEHICLES COVER A SPECTRUM OF PERFORMANCES. IN GENERAL ONE TRADES HIGH SPEEDS, AND GOOD ACCELERATION THROUGH THE SPEED RANGE, FOR VEHICLE RANGE. ALSO THE RANGE ACHIEVABLE DEPENDS UPON INSTALLED BATTERY CAPACITY AND THE VEHICLE DUTY CYCLE. HENCE, EACH VEHICLE DIFFERS; THERE IS NO TYPICAL ELECTRIC ROAD VEHICLE. TAKING TWO VEHICLES AS EXAMPLES: THE ENFIELD AUTOMOTIVE CAR HAS A QUOTED RANGE OF ABOUT 55 MILES NON-STOP ON LEVEL ROAD IN DRY CALM CONDITIONS AND A MAXIMUM SPEED OF 40 MILES PER HOUR. A TYPICAL MILK FLOAT ON THE OTHER HAND MAY HAVE A TOP SPEED OF 15 MPH AND A RANGE IN USE OF UP TO 40 MILES. LEAD ACID BATTERY ENERGY DENSITY OF 40 WH/KG APPEARS TO BE WITHIN REACH NOW, ALTHOUGH ACHIEVABLE LIFE IS NOT YET DEFINED. AN ENERGY DENSITY OF 50 WH/KG MAY BE ACHIEVABLE IN THE 5-10 YEAR TIMESCALE, BUT THE ASSOCIATED LIFE CANNOT BE FORECAST. SUCH A BATTERY WOULD GIVE A LIGHTER VEHICLE FOR A GIVEN PAYLOAD AND RANGE, AND MAY YIELD CONSEQUENT SAVINGS IN THE VEHICLE STRUCTURE AND ENERGY CONSUMPTION. ALTERNATIVELY A HIGHER RANGE COULD BE ATTAINED. COSTS FOR SUCH BATTERIES ARE AN UNKNOWN.

8. THE SODIUM SULPHUR BATTERY HAS BEEN IDENTIFIED AS POSSIBLY SUITABLE FOR ROAD VEHICLES. THE TIMESCALE OF AVAILABILITY IS UNCERTAIN DEPENDING ENTIRELY UPON SUCCESS OF THE DEVELOPMENT PROCESS. COSTS ARE AT PRESENT INDEFINABLE. THE PERFORMANCE CHARACTERISTIC OF PRIMARY INTEREST IS ENERGY DENSITY. FORECAST ENERGY DENSITY FOR THE SODIUM SULPHUR BATTERY IS AS HIGH AS 200 WH/KG. THE HIGH OPERATING TEMPERATURE OF THE BATTERY COULD PLACE CONSTRAINTS ON ITS APPLICATION.

9. ELECTRIC CARS ARE NOT MANUFACTURED ON A LARGE SCALE IN THE UK
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BUT IT IS NOT ENVISAGED THAT IF THEY WERE PRODUCED IN VOLUME THERE WOULD BE PRODUCTION OF TECHNICAL PROBLEMS OF UNUSUAL DIFFICULTY. IF LEAD ACID BATTERIES WERE USED THE QUANTITY OF METAL REQUIRED COULD BE SIGNIFICANT, AND MAY BE A RESTRAINT.

10. IMPEDIMENTS MIGHT BE LACK OF RANGE AND LONG BATTERY RECHARGE TIMES WHICH COULD RESTRICT THE FLEXIBILITY AND AVAILABILITY NORMALLY ASSOCIATED WITH PERSONAL TRANSPORT AS A RESULT OF THE HIGH WEIGHT OF THE LEAD ACID BATTERY. THE LATTER RESTRAINT WOULD NOT BE PRESENT WITH THE USE OF ADVANCED BATTERIES BUT COULD BE REPLACED BY OBJECTIONS TO OTHER FACTORS I.E., HIGH TEMPERATURES, REACTIVE MATERIALS ETC."
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